



NC Plumbing Code

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100 Chapter 1 Administration

Definitions - Question: I have a pool house that has a watercloset and a Lavatory. The drain line will run from the pool house to the house and tie in to the building drain, which will then be connected to the sewer and run to the tap at the street. Does the line running from the pool house to the house have to be a 4 inch like a sewer or can it be a 3 inch line?

Answer: The definition of a Building Sewer is that part of the drainage system that extends from the building drain and conveys the discharge to the public sewer.

The line from the pool house does not technically meet the definition of a Building Sewer, therefore a 3 inch line would be adquete. The pool house would need to be vented with a vent to open air.

BUILDING DRAIN. That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and that extends to 10 feet (3048 mm) beyond the walls of the building and conveys the drainage to the building sewer.



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BUILDING SEWER. That part of the drainage system that extends from the end of the building drain and conveys the discharge to a public sewer, private sewer, individual sewage disposal system or other point of disposal.

200 Chapter 2 Definitions

300 Chapter 3 General Regulations

303.4 - Question: Section 303.4 states “Appliances shall not be installed in a location where subject to mechanical damage unless protected by approved barriers.” What is an example of “approved barriers” which is appropriate for protection of appliances from vehicle impact in a one-and-two family dwelling garage?

Answer: Examples of approved barriers for protection of appliances from vehicle impact in a one-and-two family dwelling garage include:

a) pipe bollards extending three feet above the floor examples:

- 2 inch Schedule 40 steel pipe set in a concrete floor;
- 2 inch Schedule 40 steel pipe set in a cored hole in an existing concrete floor and sealed with epoxy
- 2 inch Schedule 40 steel pipe welded to a ¼ inch steel base plate that is anchored to the concrete floor with four ½ inch x 2 ½ inch (embedment depth 2 ¼ inch) anchor bolts

b) curb stops and/or raised pads of not less than 5 ½ inches set not less than 40 inches from the appliance.

Note that if the appliance is located out of the normal path of travel of vehicles, no protection is required.

See attached NCDOL Interpretation

305.4 - Question: Do sleeves need to be sealed on both sides?



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Answer: Yes, Section 305.4 NCPC requires the annular space between the sleeve and the pipe to be filled or caulked in an approved manner. The intent is to prevent stress from being applied to the pipe and to allow the pipe to move due to expansion, contraction, or settling. Sealing both sides prevents debris from accumulating in the annular space.

305.4 Sleeves. Annular spaces between sleeves and pipes shall be filled or tightly caulked in an approved manner. Annular spaces between sleeves and pipes in fire-resistance-rated assemblies shall be filled or tightly caulked in accordance with the International Building Code.

305.6 - Question: I am being told the code does not allow water supply lines to be installed outside a building, unless they are below grade. Is this true?

Answer: The code currently does not address water lines outside above grade. It eludes to the installation being prohibited. The ICC plumbing code states if it is outside, it shall be below grade. Working with TAB, the following interpretation was developed:

Installation of water lines outside a structure above grade is prohibited. If this type of installation is unavoidable, then one of the following options may be used:

1. Use of a listed heat tape/trace providing protection from the frost line to the point of termination above grade or where the pipe enters the structure.
2. Provide a listed enclosure to prevent freezing
3. Provide a sealed engineer's letter providing details on how to protect the pipe.

The official interpretation is attached and has been uploaded to our website.

305.6.1 - Question: Are soil and waste traps required to be protected from freezing?

Answer: Yes. Section 305.6.1 requires soil and waste traps to be protected from freezing when placed in the exterior wall or in an unconditioned space. A crawl



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space is not considered unconditioned. Traps placed in the exterior wall or an unconditioned space shall be insulated with a minimum of R=6.5 insulation.

312.2 - Question: I was told that Mecklenburg County does not do underslab inspections for residential plumbing, is this true?

Answer: Underslab inspections are required per 312.2 NCPC for DWV and 312.5 NCPC for water supply system.

312.2 Drainage and vent water test. A water test shall be applied to the drainage system within the building either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest openings of the section under test, and each section shall be filled with water, but no section shall be tested with less than a 10-foot (3048 mm) head of water. In testing successive sections, at least the upper 10 feet (3048 mm) of the next preceding section shall be tested so that no joint or pipe in the building, except the uppermost 10 feet (3048 mm) of the system, shall have been submitted to a test of less than a 10-foot (3048 mm) head of water. This pressure shall be held for at least 15 minutes. The system shall then be tight at all points.

312.5 Water supply system test. Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or an air test of not less than 100 psi (688 kPa). This pressure shall be held for at least 15 minutes. The water utilized for tests shall be obtained from a potable source of supply. The required tests shall be performed in accordance with this section and Section 107.

312.5 - Question: What pressure is defined as working pressure in section 312.5?

Answer: There is no definition of working pressure in the NC plumbing code. Working pressure as defined by ASSE is the maximum pressure in a water piping



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system or its appurtenances allowable under normal working conditions.
Maximum water pressure is limited to 80 psi by section 604.8 of the plumbing code.

Therefore the testing of a section of or the entire water supply system, including the distribution and service piping, will be tested to either a minimum of 80 psi working water pressure or a minimum of 100 psi air pressure per section 312.5 of the plumbing code. The pressure is to be held for a minimum of 15 minutes. When doing alterations or repairs the new work shall be isolated from the remainder of the system and tested separately. Only the affected portion of the system needs to be tested after repairs or alterations.

See: NCDOL Interpretation

400 Chapter 4 Fixtures, Faucets & Fittings

403.1 - Question: A church is adding square footage to their fellowship hall. According to Table 403.1 they would need to add fixtures. Can they utilize the facilities in the sanctuary (separate building within 25 feet) instead of adding fixtures to accommodate additional people load per Table 403.1 footnote j, assuming sanctuary can accommodate additional load?

Answer: Under footnote j, plumbing fixtures will have to be increased when rearrangement of a space or area results in an increased occupant load and refers to urinals. Footnote (e) provides some special conditions for religious facilities. Footnote e for table 403.1 reads

“e. The number of fixtures provided shall be based on either the capacity of the church sanctuary or the church educational building (including fellowship halls and multiple purpose rooms), whichever is larger and within 300 feet (91.44 m).” This means that the educational building or fellowship hall could be a separate building with the required number of toilet fixtures within 300 feet based on the



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larger of the occupancies. The plumbing fixtures are required to be available any time the buildings are in use. If the church decides to use the plumbing fixtures in the main building to satisfy the fixture count for the fellowship hall, or vice versa, an authorized church representative should provide a signed letter for file documentation to the code official stating that the required facilities will always be available and accessible to occupants when the building is in use.

403.3 - Question: Are restrooms required in an unattended, self service laundromat?

Answer: Yes, laundromats are a business occupancy. There may not be regular employees, but there will be customers.

406.3 - Question: Is the use of a 3x2 combination laid on it's back allowed to satisfy the requirement to transition to a 3 inch branch?

Answer: Yes, the use of the fitting in this configuration is acceptable.

500 Chapter 5 Water Heaters

504.7 - Question: Are pans required for tankless waterheaters?

Answer: In our current code, section 504.7 requires a pan for all types of waterheaters. It doesn't distinguish between tank or tankless.

This language changed in the 2012 IPC, our current code is based on the 2009 IPC.

The new language only requires a pan for storage-tank type waterheaters only.

"504.7 Required pan. Where a storage tank-type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a galvanized steel pan having a



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material thickness of not less than 0.0236 inch (0.6010mm) (No. 24 gage), or other pans approved for such use."

We have decided to accept this new code language as an alternate method. This new code language would not require pans under tankless waterheaters.

600 Chapter 6 Water Supply and Distribution

606.2 - Question: Are shut off valves required for pot fillers?

Answer: Bill Moeller at NCDOL gave the following statement:

"Technically a fixture requires water and discharges waste to the drainage system. The pot filler is a water supply fitting. Using the strict code language, it's my interpretation that a shutoff valve can be recommended but not required for a pot filler with no sink."

PLUMBING FIXTURE. A receptacle or device that is either permanently or temporarily connected to the water distribution system of the premises and demands a supply of water therefrom; discharges wastewater, liquid-borne waste materials or sewage either directly or indirectly to the drainage system of the premises; or requires both a water supply connection and a discharge to the drainage system of the premises.

613.1 - Question: Can a mixing valve have an adjustment knob?

Answer: The code requires mixing valves comply with ASSE 1016 or ASSE 1017. If the valve meets these standards and have an adjustment knob, they would be considered code compliant.

613.1 Temperature-actuated mixing valves. Temperatureactuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1016 or ASSE 1017.

700 Chapter 7 Sanitary Drainage



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706.3 - Question: Can a sanitary tee be installed on it's back to connect a dry vent?

Answer: Yes, there is no problem for venting only. This configuration could not be used to receive waste from a stack. The 2009 IPC commentary clarifies this installation is ok on p7-25

Commentary:

"Sanitary tees may be used for horizontal drainage flow through the run of the tee where the branch of the tee is for venting only and is oriented within 45 degrees of the vertical. A sanitary tee can be installed on its back for venting applications in sanitary drainage."

706.4 - Question: I heard the building code council deleted the section on heel-inlet quarter bends, does this mean they are not allowed anymore?

Answer: Effective January 1, 2016, section 706.4 was deleted from the plumbing code. This action only helped to clarify when a heel- or side-inlet was allowed. By deleting section 706.4, the only reference let to heel- and side-inlet quarter bends is found in footnote "f" of Table 706.3, which reads as follows:

"The heel inlet connection of a quarter bend may be used as a wet or dry vent if the heel inlet connection of the quarter bend is located in the vertical position. The heel or side inlet connection may be used as a wet vent if the quarter bend is located directly below a water closet or other fixture with one integral trap."

The footnote only contains 2 sentences. The first states a heel-inlet may be used in the vertical position as a wet or dry vent. The second, states a heel- or side-inlet may be used directly below a water closet or other fixture with an integral trap.

708.3.5 - Question: Can a backwater valve be used as the required cleanout at the junction of the building drain and sewer?



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Answer: No, Section 708.3.5 requires an approved two-way cleanout in this location. The housing for the backwater valve would not meet this requirement. 708.3.5 Building drain and building sewer junction. There shall be a cleanout at the junction of the building drain and the building sewer. The cleanout shall be outside the building wall and shall be brought up to the finished ground level. An approved two-way cleanout is allowed to be used at this location to serve as a required cleanout for both the building drain and building sewer. The cleanout at the junction of the building drain and building sewer shall not be required if the cleanout on a 3-inch (76 mm) or larger diameter soil stack is located within a developed length of not more than 15 feet (4572 mm) from of the building drain and building sewer connection and is extended to the outside of the building. The minimum size of the cleanout at the junction of the building drain and building sewer shall comply with Section 708.7.

712.3.4.1 - Question: Are alarms required for small sump pumps under a sink?

Answer: No, Section 712.3.4.1 requires an alarm for Sump Pumps. The definition of Sump is a tank or pit below normal grade of the gravity system. The alarm is required to notify the occupants there is a malfunction. The small pumps installed under a sink is not a sump. If there is a malfunction, it would backup into the sink it serves and the occupant would be able to see this.

SUMP. A tank or pit that receives sewage or liquid waste, located below the normal grade of the gravity system and that must be emptied by mechanical means.

SUMP PUMP. An automatic water pump powered by an electric motor for the removal of drainage, except raw sewage, from a sump, pit or low point.

715.1 - Question: I am plumbing a multi-story apartment and the fixtures on the first floor are below the manhole. I installed a backwater valve, but was turned down and told the fixtures above the manhole have to be connected after the backwater valve. Is this right?



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Answer: Section 715.1 requires fixtures with flood level rims below the next upstream manhole to be protected by a backwater valve. It also prohibits fixtures above the manhole from discharging through the backwater valve.

Note - Effective January 1, 2016 section 715.1 has been changed to read as follows:

"715.1 Sewage backflow. Where plumbing fixtures are installed on a floor with a finished floor elevation below the elevation of the manhole cover of the next upstream manhole in the public sewer, such fixtures shall be protected by a backwater valve installed in the building drain, branch of the building drain or horizontal branch serving such fixtures. Plumbing fixtures installed on a floor with a finished floor elevation above the elevation of the manhole cover of the next upstream manhole in the public sewer shall not discharge through a backwater valve."

800 Chapter 8 Ind./Special Waste

802.1.8 - Question: Can a 3 compartment sink connect directly to the drainage system?

Answer: Yes, in the 2012 Plumbing Code section 802.1.8 was added to clarify this is acceptable. This section only applies to sinks used to wash utensils, dishes and pots; food prep sinks are still required to be indirect per section 802.1.1. We also checked with Mecklenburg County Health Dept and they have no regulation on wash sinks.

802.1.8 Food utensils, dishes, pots and pans sinks. Sinks used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or service ware used in the preparation, serving or eating of food shall discharge indirectly through an air gap or an air break or directly connect to the drainage system.



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802.2 - Question: I have an existing floor drain in the middle of the room. Can I install a second floor drain in the room and tie it into the existing floor drain?

Answer: Yes, if there is sufficient distance between the existing floor drain and the trap seal. The additional floor drain would indirect into the existing one above the trap seal. The allowable distance between the 2 floor drains would be specified in 802.2

802.2 Installation. All indirect waste piping shall discharge through an air gap or air break into a waste receptor or standpipe. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. All indirect waste piping that exceeds 2 feet (610 mm) in developed length measured horizontally, or 4 feet (1219 mm) in total developed length, shall be trapped.

900 Chapter 9 Vents

903.1 - Question: What size stack is required for a 12 inch building drain?

Answer: It would be a minimum of half the diameter of the building drain size. In this case, a 6 inch stack would be required to open air. Note, Section 903.1 was entirely re-written by NC.

903.1 Stack required. Every building in which plumbing is installed shall have at least one stack the size of which is not less than one-half of the required diameter of the building drain, and not less than 2 inches (51 mm) in diameter. Such stack shall run undiminished in size and as directly as possible from the building drain through to the open air or to a vent header that extends to the open air.

917.8 - Question: Can you use an AAV on a grease interceptor?

Answer: Yes, section 917.8 NCPC allows the use of AAVs on tanks if part of an engineered design. The manufacturer of the interceptor also have to allow the use of an AAV.

917.8 Prohibited installations. Air admittance valves shall not be installed in nonneutralized special waste systems as described in Chapter 8. Air admittance



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valves shall not be located in spaces utilized as supply or return air plenums. Air admittance valves without an engineered design shall not be utilized to vent sumps or tanks of any type.

1000 Chapter 10 Traps and Interceptors

1100 Chapter 11 Storm Drainage

1101.4 - Question: I am installing a storm drainage system in a building. There are several conductors that pass through the building. I am being told I have to test each one. This isn't the sanitary system, only storm.

Answer: Section 1101.4 refers you to section 312. Section 312 requires a water test on the drainage system within the building.

1101.4 Tests. The conductors and the building storm drain shall be tested in accordance with Section 312.

312.2 Drainage and vent water test. A water test shall be applied to the drainage system within the building either in its entirety or in sections.

1101.8 - Question: I am installing a storm sewer lateral. The Lateral is 8 inches. I was turned down and told I need manholes instead of cleanouts.

Answer: Section 1101.8, requires cleanouts for the storm drainage system to meet the provisions of the code for the sanitary drainage system. Section 708.3.2 requires manholes for the sanitary sewer for 8 inch and larger.

1101.8 Cleanouts required. Cleanouts shall be installed in the storm drainage system and shall comply with the provisions of this code for sanitary drainage pipe cleanouts.

708.3.2 Gravity building sewers. Building sewers shall be provided with cleanouts located not more than 100 feet (30 480 mm) apart measured from the upstream entrance of the cleanout. For building sewers 8 inches (203 mm) and larger, manholes shall be provided and located not more than 200 feet (60 960 mm)



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from the junction of the building drain and building sewer, at each change in direction and at intervals of not more than 400 feet (122 m) apart. Manholes and manhole covers shall be of an approved type.

1104.3 - Question: Can a Hub drain within the building for HVAC condensate or backflow go to storm?

Answer: No, the code prohibits a floor drain from going to storm. The intent of the code is; if it looks like a drain, then people will use it as a drain. Hub drains are no different.

1104.3 Floor drains. Floor drains shall not be connected to a storm drain.

To prevent contamination of the storm water discharge with chemicals, waste, sewage, etc., the code prohibits the connection of floor drains to a storm drain. A floor drain connected to a storm drainage system invites the discharge of sanitary waste into the storm system, which will create an environmental hazard, considering that storm drainage is discharged to the environment without treatment. Another concern is that under flow conditions, a floor drain connection will act as a relief opening, thereby allowing water flow into the building.

Appendix

1300 - Question: Is a plumbing permit required for a roof permit on a flat roof?

Answer: Only if during re-roofing the design of the storm water system will be changed.

Policy

Other

Other - Question: When is NCDENR applicable for commercial sites?



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Answer: The NC Department of Insurance has interpreted that site utility projects (sewer/domestic water and/or fire installations) under the scope of the NCDENR review/approval process are exempt from the NC Building Codes. Therefore, manholes and piping connecting the manholes are exempt from the plan review/inspection process after the designer provides proof (a right to work permit). The installation of laterals requires permitting and inspections by our department. ALL of our inspections are “open ditch” inspections and SHALL NOT be covered until inspected by Code Enforcement Inspectors. Water/Combo lines 5 feet outside the structure. Sewer laterals to the first manhole.

Manufacture's Installation - Question: The inspector didn't turn me down, but said I shouldn't be testing PEX at 300 psi. Is there a maximum test pressure in the code?

Answer: There is not a maximum test pressure in the code. The manufacturer sets the maximum limits. Several manufacturers state in their installation manuals, if the test pressure exceeds 225 psi, the warranty is void. The warranty is an issue between the manufacturer and the contractor. It is not good practice to test PEX over the rating printed on the pipe.

Other - Question: I am installing a manufacturing machine that circulates water to and from the machine to a tank/filter. Will the piping between the tank and the machine need a plumbing permit?

Answer: No, if the piping is only from the tank to the machine, this would be considered process piping and is out of the scope of the plumbing code.

A117.1 - 602 - Question: Can a water dispenser on a refrigerator in a breakroom be used as a substitute for a required drinking fountain?



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Answer: No, a water dispenser on a refrigerator cannot be used as a substitution for a drinking fountain. There are specific requirements for a drinking fountain in A117.1 section 602 (these include but are not limited to spout height, arc of the water stream, spout location, etc). Also, a drinking fountain can be used without cups.

Other - Question: Can a plumber run the hydronic under floor piping for heating?

Answer: No, This is a heating application and would require the installer to have a H-1 license.

NCBC - 1109.5.1 - Question: Does a high-low drinking fountain count as 1 or 2 drinking fountains?

Answer: Per Section 1109.5.1 NCBC, a high-low is permitted to be counted as 2 separate drinking fountains.

1109.5.1 Minimum number. No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exception: A single drinking fountain that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.